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FEB 7 1941

Frick-Freezing Systems

for *Refrigeration*
Low-Temperature Work

Bulletin 147-A

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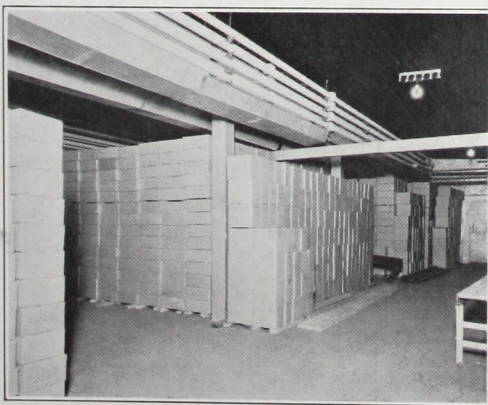
Waynesboro, Penna., U.S.A.



Mrs. America, as Shown by this Photo in a Locker Plant, is Daily Becoming More Interested in the Sale and Use of Frozen Foods.

Now that such varied products as oysters, green peas, spring chicken, raspberries, and beef are being frozen by the millions of pounds each year, there is need for a fast-freezing system which will handle this low-temperature work with efficiency and economy. Most quick-freezing plants must adapt themselves to handling different products in different seasons. Some products require one temperature and some another. Problems of how to prevent drying-out of the foods, how to save unnecessary labor, and how to maintain the original freshness and flavor, must be successfully solved.

From experience with hundreds of these low-temperature plants, both in this and other countries, Frick Engineers have developed the Frick-Freezing Systems illustrated in this bulletin. These differ in arrangement to suit the needs of the

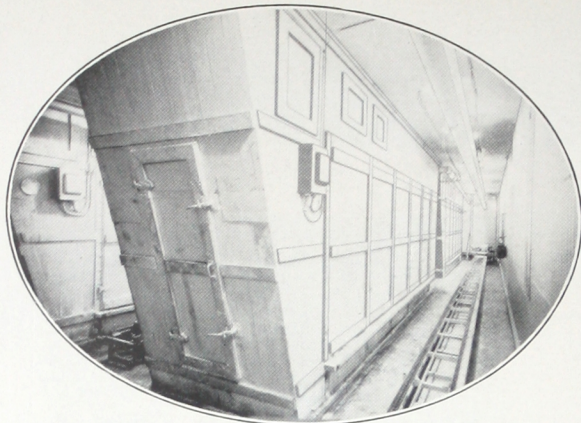


The Frozen Foods are Kept in Rooms Like That Shown at Left, at Temperatures Below Zero, by a Two-Stage Frick Refrigerating System. This Design Reduces Power Costs Approximately One-third Over Single-Stage Operation. Seabrook Farms, Bridgeton, N. J.



The Largest Zero Storage Building in the World, Containing $1\frac{1}{4}$ Million Cubic Feet, Shown Above, is part of a Group of such Storages Having a Total Capacity of More Than 30,000,000 Pounds, Located at Seabrook Farms, Bridgeton, N. J.



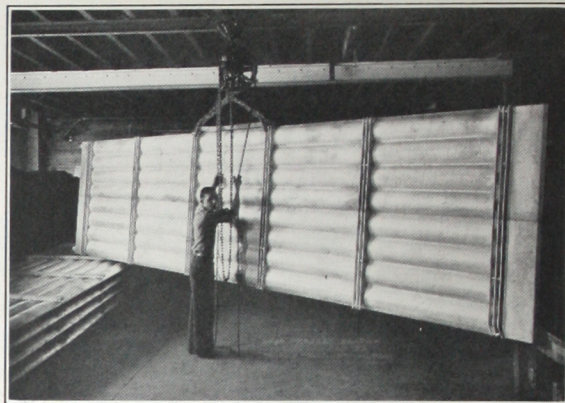


35,000,000 Pounds of Fruits and Vegetables are Quick-Frozen Yearly at Deerfield Packing Corp., Seabrook Farms, Bridgeton, N. J. Air Blast Freezers Shown Above Carry Part of this Load. Birdseye Plate Frosters Owned by Frosted Foods Sales Corp. (Subsidiary of General Foods Corp.) Freeze the Foods they Market Under the Birdseye Brand.



Pat Denham's Locker Plant at Oklahoma City. Designed for 5000 Compartments, Has a Frick-Freezing System Connected to a $5\frac{3}{4}$ by 4 Booster Compressor.

Double Conveyors in a Frick-Freezing Tunnel Hardening Packaged Ice Cream in 50 Minutes' Time at 45 to 60 Deg. Below Zero: Hershey Ice Cream Co., Harrisburg, Penna.

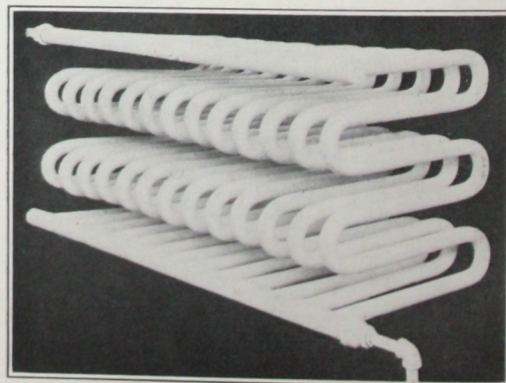


Welded Brine Plates Used in Freezers Shown on Left. These Cadmium Plated Sections are Said to be the Largest of this Type Ever Built. They are Installed Like Shelves on which the Products to be Frozen are Placed. A Cold Air Blast Passes over the Products, Heat being Rapidly Removed by Both Conduction and by Convection.

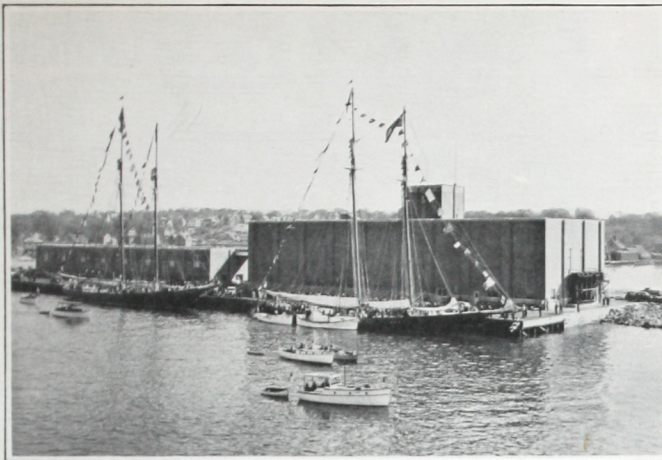
owner, but are based on the same fundamental design.

Frick Type VW coils, connected to a booster compressor, are installed in a bunker above the space to be cooled. Suitable fans keep a moderate blast of air in motion over the coils and the products placed below them.

Push trucks, mounted on four wheels, are used for carrying the foods into the cold spaces. If the products have not been boxed, they are either placed in pans or are wrapped before being put on the hand trucks. The trucks move in a straight line through the freezer compartment.



Frick Type VW Coils are Ideal for Maintaining Low Temperatures with Economy. See Complete Reasons in Ice and Frost Bulletin 156-B.

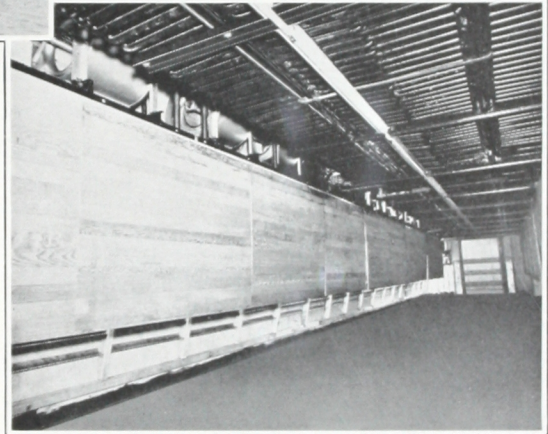


The Gloucester (Mass.) Fish Pier, with the "Bluenose" and the "Gertrude L. Thebaud," Famous Racing Schooners, Tied up at the Wharf. Total Storage Capacity of the Plant is 5,000,000 Lb. of Fish and 800 Tons of Ice. Seven Frick Compressors, Two of which are Boosters, Carry the Cooling Load.

The first compartment serves both as a pre-cooler and as an ante room for the low-temperature freezer. Swinging doors of the air-lock type separate the pre-cooler from the freezer in the center. The freezer itself is preferably held at temperatures between 20 and 60 deg. below zero, Fahr. The products can remain in the tempering room a reasonable time before being rolled into the packing space, from which they enter the cold storage, where they are held until shipped.

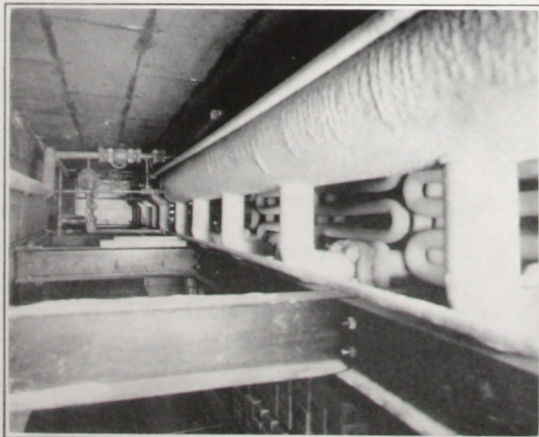
This simple system takes the mystery and guess-work out of quick-freezing. The equipment is all of durable, dependable

One of Four Large Frick-Freezing Rooms, Handling 226,000 Lb. of Seafood Daily, at the Gloucester Fish Pier.



Same Room as that above, with Bunker Doors Lowered to Show Frick VW Coils and Numerous Air Blowers

We believe that more frozen foods are produced in Frick-Freezers of one form or another than by any other method.



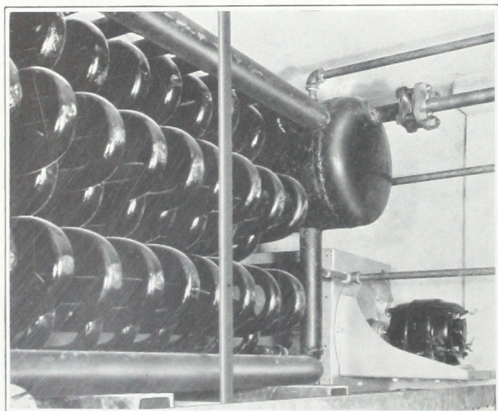
The General Ice Cream Co. Uses Frick VW Coils with Excellent Results in the Hardening Rooms of Several of its Plants. This one is at Utica, N. Y.

Big Hardening Room. Measuring 63 by 48 Ft., at the Rochester, N. Y., Plant of the General Ice Cream Co. VW Coils and Fans Overhead.

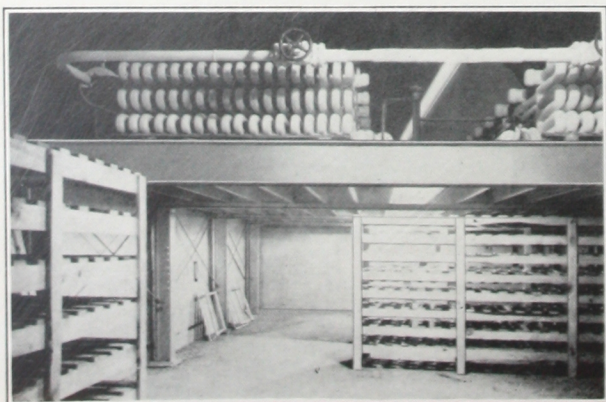




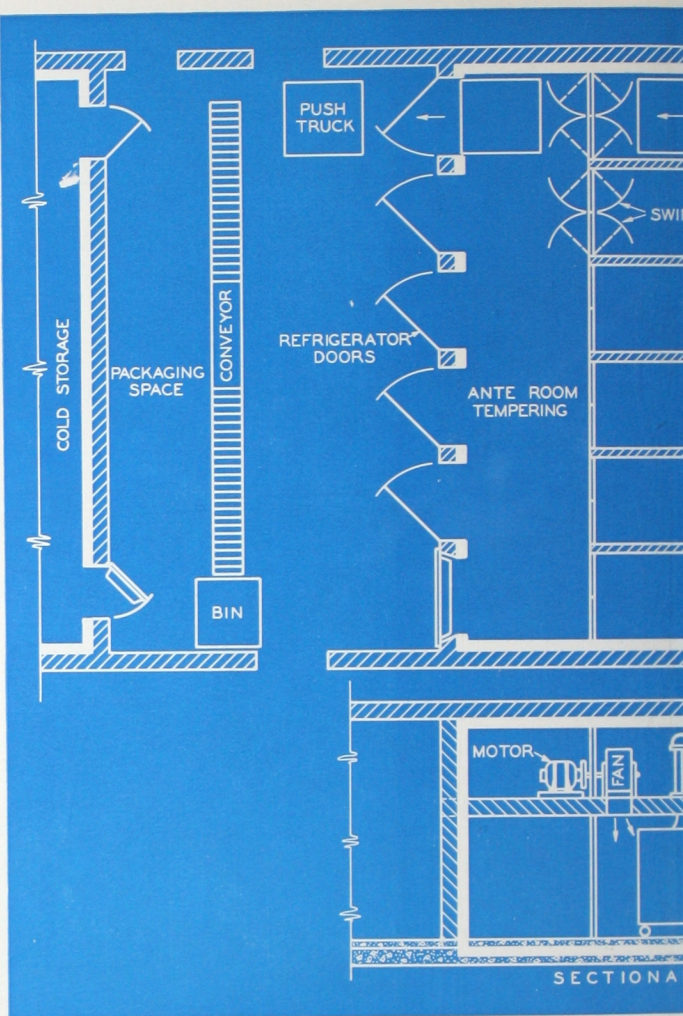
Push-Truck in the Frick-Freezer of a Large Locker Plant. Low-Wheeled Buggies, as Used in Dairy Plants, are also Popular.



VW Coils in the Air Blast Bunker of a Small Frick-Freezing System at Greencastle, Penna. Fan and Motor Appear at the Right.



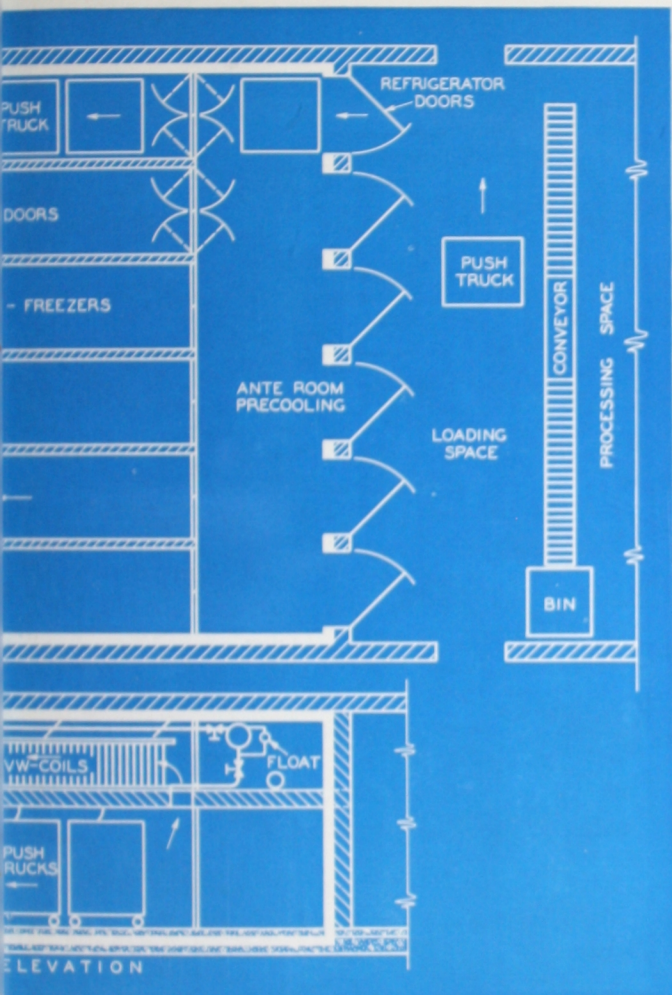
A Temperature of Minus 30 deg. F. is Maintained by the VW Coils and Fans in This Frick-Freezer at the Liberty Ice and Cold Storage Plant in New Orleans.



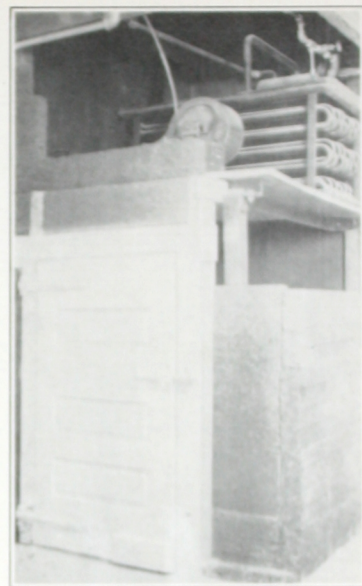
Layout of a Typical Frick-Freezing System, where Processing and Packing are Done in Spaces. Product in a Straight Line Through the Precooling. Flexible and Efficient.

construction, and has proved itself able to stand up under many years of service. Defrosting of the coils is only required a few times a year. The comparatively slow motion of the air prevents dehumidifying of the foods. Almost any product which could be named can be moved with ease into the Frick-Freezer, where it will be frozen in a minimum time. No complicated mechanisms are used.

Any temperature desired, down to 80



Adapted to Handling Practically Any Product. Giving Temperatures. Push-Trucks Carry the Freezing, and Tempering Rooms. The Most Freezing System Known.



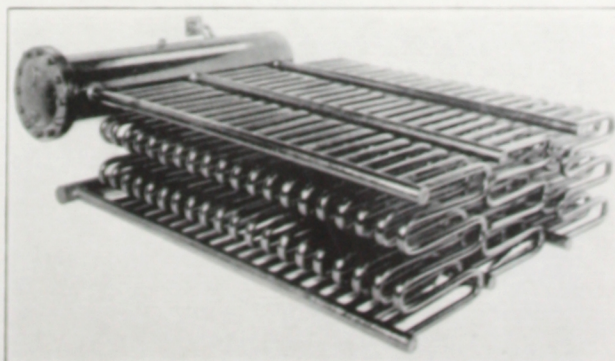
Frick-Freezing Room under Construction in a Small Locker Plant at Memphis, Missouri



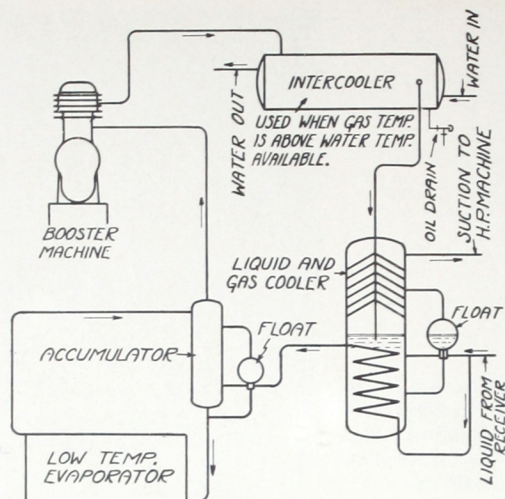
The Commonwealth Ice and Cold Storage Co., on Boston's Fish Pier, has a series of Frick-Freezing Rooms with VW Coils and Fans Overhead.

deg. below zero F, or possibly lower, can be maintained. When wanted, the freezer can be equipped with shelf coils or cold plates, but it is only in special cases that shelves are recommended.

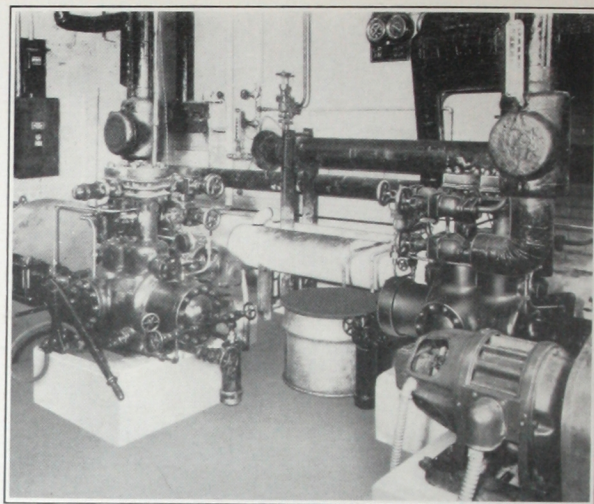
Careful records of costs show that the Frick-Freezing System is a money maker, as has been further proved by the numerous repeat orders for it placed with us by the largest operators in this field. Whether your work involves a small freezer for a



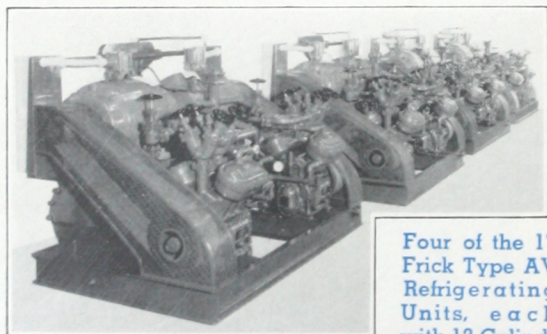
One of Several Adaptions of VW Coils, Showing Float Accumulator for Maintaining Flooded Operation Automatically. These Coils were Installed Close to the Ceiling of a Large Frick-Freezing Room.



The Standard Arrangement of the Frick Booster System for Producing Low-Temperature Refrigeration is Shown by this Diagram.

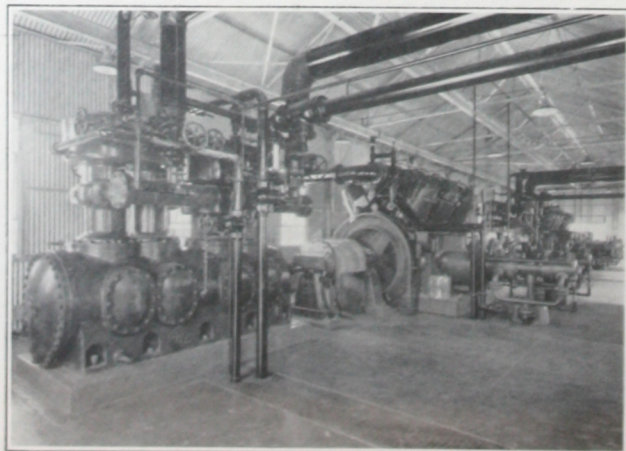


Two-stage Frick Carbon Dioxide Plant Producing Temperatures down to 40 deg. Below Zero in the Test Laboratory for Airplane Equipment at the General Electric Co., Schenectady, N. Y.



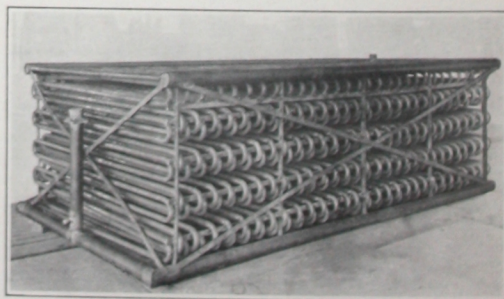
Four of the 17 Frick Type AV Refrigerating Units, each with 12 Cylinders, Used by General Foods for Portable Service on Quick-Freezing Work.

Two Frick Vertical Compound Compressors Condense 38,000 Gal. of Gasoline from Natural Gas Daily at Temperatures Below Zero in this Plant near Palestine, Texas.



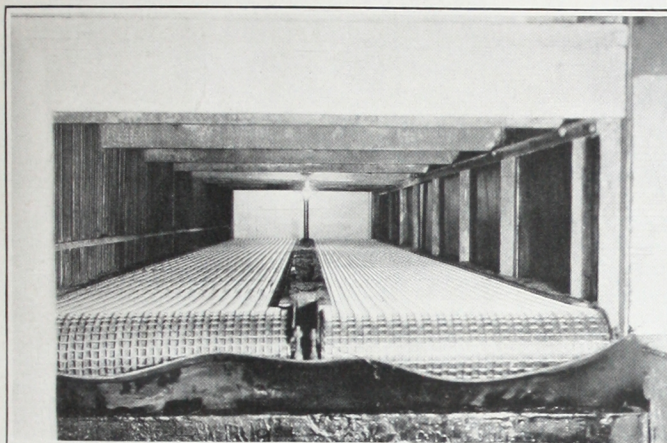
locker plant, or equipment to handle hundreds of pounds of products a day, you will find Frick-Freezing Systems of similar size in daily operation, to which we will be proud to refer you.

To those not familiar with the details of such low-temperature plants, additional literature from the Frick Ice and Frost series is available. Bulletin 156 describes Type VW coils. Bulletin 516 explains the operation of ammonia booster compressors. The standard refrigerating machines, which receive the ammonia discharge from the booster compressors, are discussed in Bulletin 112. Locker plants are illustrated in Bulletin 145.

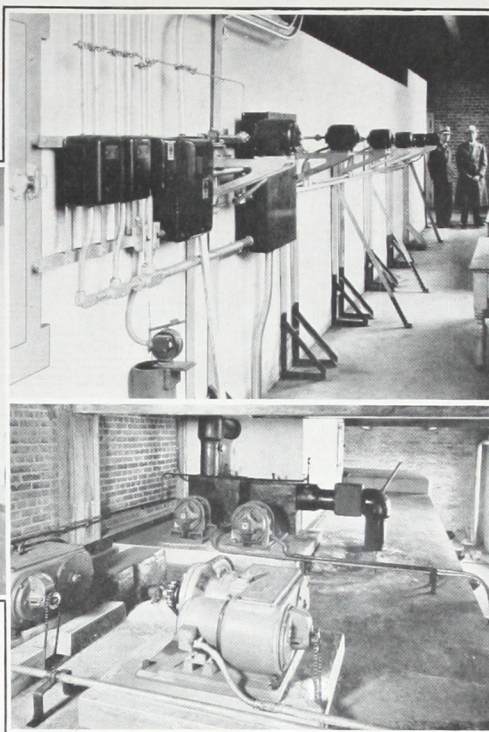


Double VW Coil Used in Fast-Freezing Work. Large Headers Provide Uniform Circulation of Ammonia through the Pipes.

Right: Motors Driving the Fans in the Tunnel Shown Below.



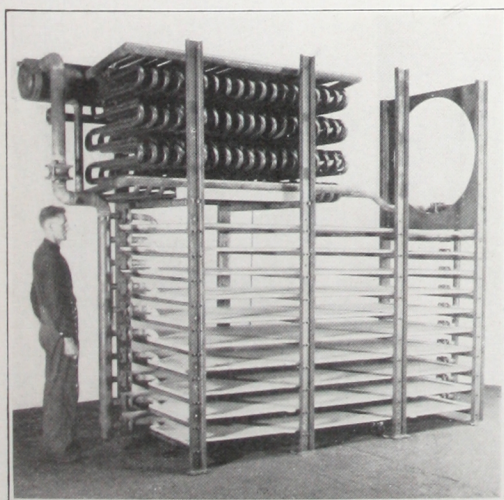
Conveyors in a Frick-Freezing Tunnel at Mobile, Ala., Capable of Handling 2000 Lb. of Fruit, Vegetables, or Seafood per Hour. An 8 $\frac{3}{4}$ by 6 Booster Carries the Low-Temperature Load.



Variable-speed Drives for the Belt Conveyors; Brine Pumps; and Housing for Zig-Zag Cooler: all on Top of Frick-Freezing Tunnel at Mobile.

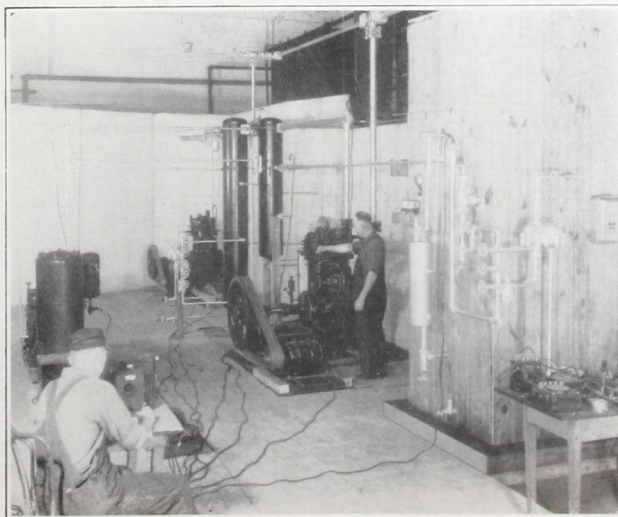
Typical quick-freezing plants are reported in detail in numerous issues of the Frick System.

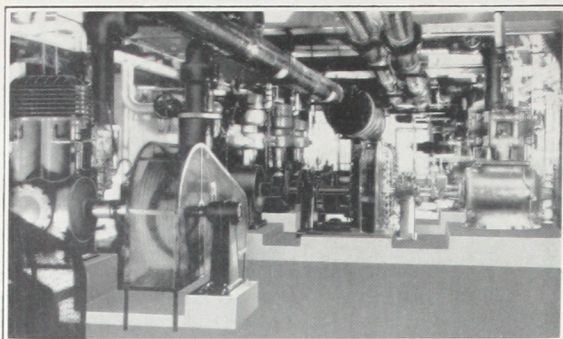
The nearest Frick Branch or Distributor will be glad to supply you with additional information on Frick-Freezing Systems, without obligation on your part. Let us assist you in laying out a plant which will do your freezing work reliably, and at a profit to you.



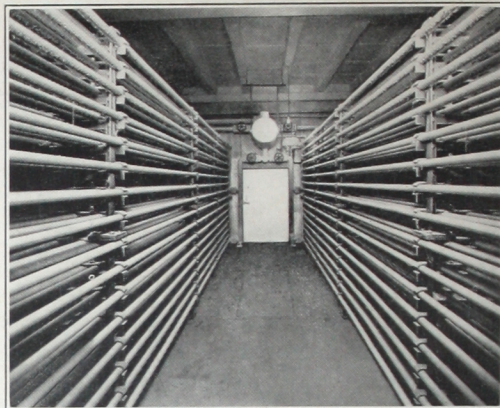
Fixed-plate Freezer Arranged for Circulating Either Ammonia or Cold Brine through the Shelf Plates and the Coils Overhead. Opening at the Right Accommodates Propellor Fan. Insulated Casing has Doors Giving Access to all Shelves.

Three-Stage Frick-Freezing System which Produced Temperatures 100 Deg. below Zero F. in the Frick Test Laboratory. The Wires Connect Electrical Thermometers. (Photo taken before insulation completed.)

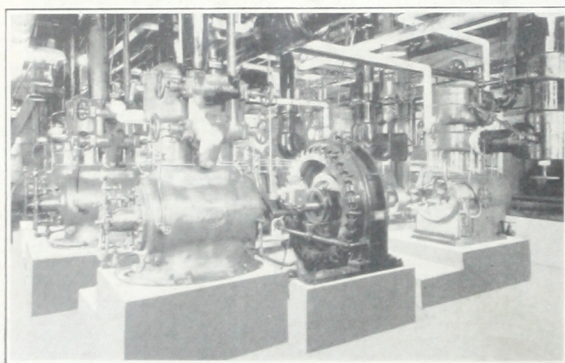




In the Two Compressor Rooms Shown Above and Below, Located at Seabrook Farms, Bridgeton, N. J., there are 10 Large Frick Booster Compressors and 9 Standard Frick Compressors. Those Shown at Top are owned by Frosted Foods Sales Corp., and those Below by Deerfield Packing Corporation. Temperatures Down to 45 Degrees Below Zero are Obtained with These Compressors.



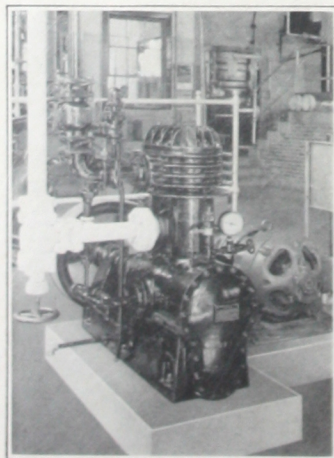
One of Two Rooms, each 15 by 30 ft., Held at 20 Deg. Below Zero for Freezing Shrimp: Port Lavaca, Texas. The Coils, Totalling 13,600 Ft. in Length, are Connected to a Frick 11½ by 8 Booster Compressor.



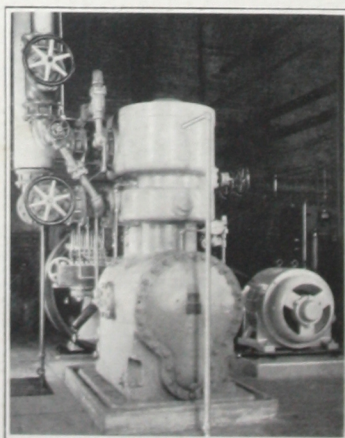
The Important Savings Effected with Frick Booster Compressors (up to 34%) Make them the Logical Choice for Low-Temperature Work. Shown Below are Some of the Sizes of the Complete Line of Frick Booster Machines.



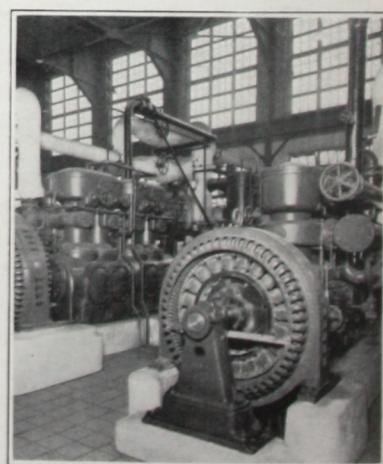
One of two Enormous Frick-Freezers, 140 Ft. Long by 100 Ft. Wide, at the Plant of Marion T. Fannally, Inc., at Ponchatoula, La. Over 500 Barrels of Fruit, each Weighting 450 Lb., can be Frozen per Day. The Air is Cooled by VW Coils Above Suitable Openings in the Ceiling.



Small Frick Booster Compressor Carrying Low Temperatures in an Ice Cream and Locker Plant.



13½ by 9 Booster in Service Quick-Freezing Meats, Poultry, and Fish. Note Small Size of Motor Required.



Four-Cylinder Standard (Left) and Booster (Right) Machines Delivering 687 Tons of Refrigeration for Low-Temperature Freezing.